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ABSTRACT

In an effort to look at factors moderating the negative effects of preterm low birthweight and perinatal illness, the study followed up (at 7 and 12 months of age) 50 preterm infants whose cumulative morbidity score was greater than 100 and/or who had a life threatening complication. Home visits provided ratings of maternal sensitivity, the Bradley and Caldwell (1980) HOME inventory provided ratings of environmental quality, and developmental tests provided ratings of cognitive development. Results found that the quality of the infants' home environment combined with the severity and duration of perinatal illness were strongly associated with early cognitive development. The robustness associated with rapid recovery from early illness combined with a sensitive and stimulating caregiver appeared to be characteristics of resilience for high risk infants. (DB)

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INVULNERABLE HIGH RISK PRETERM INFANTS

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Invulnerable High Risk Preterm Infants

There is renewed interest in the concept of invulnerable children, stimulated in large part by papers by Garmezy (1981), Rutter (1979), and Werner and Smith (1982). The idea that some children function competently in the face of potentially handicapping conditions appeals both to models of preventive mental health and to the romantic notions of individual robustness popular in traditional American culture. Considerable theoretical and methodological work remains to be done to explicate the concept variously labeled "stress-resistant", "resilient", or "invulnerable". In one of the clearest analyses of resiliency, Werner and Smith (1982) described children who were functioning competently as young adults in spite of demographic risk factors. Their procedure was to identify children who were at risk and search for sources of individual differences in competence within that group.

We followed a parallel strategy in the present study. We selected from an original sample of 152 low birthweight infants a subgroup of 50 preterm infants (gestational age < 38 weeks) who were at risk because of early perinatal illness in order to describe factors that are predictive of competence for at risk preterm infants. These 50 infants are described in Table 1. Medical data for each infant was coded from the hospital charts using a morbidity scale developed by Minde, et al (1983). The criteria for classifying an infant as ill was a cumulative morbidity score greater than 100 (N = 30) and/or the presence of a life-threatening complication. All twenty infants who met the latter criteria required IPPV for at least 24 hours due to respiratory distress related to Hyaline Membrane Disease (N = 14), pulmonary insufficiency (N = 4), or CNS despression (N = 2).

At 7 and 12 months of age (corrected for weeks of prematurity), home visits provided ratings of maternal sensitivity (based upon Ainsworth's procedures, Ainsworth, Bell & Stayton, 1974) and the completion of Bradley and

Caldwell's (1980) HOME inventory. At 7 months, the Denver Developmental Screening Test (Frankenberg, Dodds & Fandal, 1970) was given. The Bayley Scales of Mental and Motor Development (Bayley, 1969) were administered at the 12-month visit.

Because the HOME scores and sensitivity ratings were highly intercorrelated, they were combined into a composite variable called quality of the environment. Also occupational level, maternal and paternal education were combined into a variable called social economic class. These two variables were independent of birthweight, gestational age, Apgar scores, the summary morbidity score and other measures of the medical status of the infant at birth. These composite scores, the cumulative morbidity score, gestational age, birthweight and the number of delays on the Denver Developmental Screening Test were entered as predictor variables in four multiple regression analyses with corrected (for weeks of prematurity) and uncorrected MDI and PDI Bayley scores as the dependent variables.

For the prediction of corrected MDI, the morbidity, quality of environment and social economic summary scores were the significant predictor variables ($R = .64$, $F(3,42) = 9.81$, $p < .001$). The significant predictor variables for corrected PDI were the number of delays on the Denver and the morbidity summary score ($R = .50$, $F(2,43) = 7.32$, $p < .001$). For uncorrected MDI the predictor variables were gestational age together with the environmental and morbidity summary scores ($R = .68$, $F(3,43) = 12.37$, $p < .001$); and for uncorrected PDI, morbidity, birthweight, and delays on the Denver ($R = .62$, $F(3,42) = 9.04$, $p < .001$).

Within a sample of premature infants who were at biological risk during the perinatal period, the quality of the infants home environment combined with the severity and duration of perinatal illness were strongly associated with early cognitive development. The robustness associated with rapid

recovery from early illness combined with the good fortune to have a sensitive and stimulating caregiver appear to be characteristics of resilience for high risk infants. As might be expected, environmental factors were not as prominent in accounting for variations in psychomotor development.

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Table 1. Medical and demographic data and 12-month Bayley scores (N = 50)

Variable	Mean	Standard Deviation
Birthweight	1330.8 grams	535.6
Gestational Age	29.5 weeks	3.0
Days in Hospital	75.7	46.0
Morbidity Score	150.1	139.2
Maternal Age	12.0 years	4.4
Maternal Education	12.0 years	2.1
Paternal Education	12.6 years	2.9

Table 2. Bayley Score Means

Variable	Mean	Standard Deviation
Corrected MDI	115.3	15.4
Corrected PDI	90.9	16.1
Uncorrected MDI	91.0	18.0
Uncorrected PDI	78.0	14.0